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Conference Abstract

Building an OWL ontology with Xper3

Florian Pellen‡, Sylvain Bouquin‡, Isabelle Mougenot§, Régine Vignes-Lebbe‡

‡ Institut Systématique Evolution Biodiversité (ISYEB), Sorbonne Université, MNHN, CNRS, EPHE, 57 rue Cuvier, CP 48, 75005 Paris, France
§ UMR 228 Espace Dev, UM UR UG UA IRD, Maison de la Télédétection, 500 rue JF Breton , 34093 Montpellier Cedex 5, France

Corresponding author: Régine Vignes-Lebbe (regine.vignes_lebbe@upmc.fr)

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Abstract

Xper3 (Vignes Lebbe et al. 2016) is a collaborative knowledge base publishing platform that, since its launch in november 2013, has been adopted by over 2 thousand users (Pinel et al. 2017). This is mainly due to its user friendly interface and the simplicity of its data model. The data are stored in MySQL Relational DBs, but the exchange format uses the TDWG standard format SDD (*Structured Descriptive Data* Hagedorn et al. 2005). However, each Xper3 knowledge base is a closed world that the author(s) may or may not share with the scientific community or the public via publishing content and/or identification key (Kopfstein 2016). The explicit taxonomic, geographic and phenotypic limits of a knowledge base are not always well defined in the metadata fields.

Conversely terminology vocabularies, such as Phenotype and Trait Ontology *PATO* and the Plant Ontology *PO*, and software to edit them, such as Protégé and Phenoscape, are essential in the semantic web, but difficult to handle for biologist without computer skills. These ontologies constitute open worlds, and are expressed themselves by RDF triples (*Resource Description Framework*). Protégé offers vizualisation and reasoning capabilities for these ontologies (Gennari et al. 2003, Musen 2015).

Our challenge is to combine the user friendliness of Xper3 with the expressive power of OWL (*Web Ontology Language*), the W3C standard for building ontologies. We therefore focused on analyzing the representation of the same taxonomic contents under Xper3 and under different models in OWL. After this critical analysis, we chose a description model

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that allows automatic export of SDD to OWL and can be easily enriched. We will present the results obtained and their validation on two knowledge bases, one on parasitic crustaceans (*Sacculina*) and the second on current ferns and fossils (Corvez and Grand 2014). The evolution of the Xper3 platform and the perspectives offered by this link with semantic web standards will be discussed.

Keywords

Xper3, knowledge base, ontology, OWL, RDF triples

Presenting author

Régine Vignes Lebbe

References

- Corvez A, Grand A (2014) Enabling comparisons of characters using an Xper2 based knowledge-base of fern morphology. Phytotaxa 183 (3): 145-158. https://doi.org/10.11646/phytotaxa.183.3.2
- Gennari JH, Musen MA, Fergerson RW, Grosso WE, Crubézy M, Eriksson H, Noy NF, Tu SW (2003) The evolution of Protégé: an environment for knowledge-based systems development. International Journal of Human-Computer Studies 58 (1): 89-123. https://doi.org/10.1016/s1071-5819(02)00127-1
- Hagedorn G, Thiele K, Morris R, Heidorn PB (2005) Structured Descriptive Data (SDD) w3c-xml-schema, Version 1.0. Biodiversity Information Standards (TDWG). URL: http://www.tdwg.org/standards/116
- Kopfstein S (2016) Revising Australian Pristomerus (Hymenoptera, Ichneumonidae, Cremastinae): species with a tooth on the hind femur. Zootaxa 4168 (2): 201. https://doi.org/10.11646/zootaxa.4168.2.1
- Musen MA (2015) The Protégé project: A look back and a look forward AI Matters. Association of Computing Machinery Specific Interest Group in Artificial Intelligence. 1. https://doi.org/10.1145/2557001.25757003
- Pinel A, Bouquin S, Bourdon E, Kerner A, Vignes-Lebbe R (2017) Three years of Xper3 assessment: towards sharing semantic taxonomic content of identification keys. Proceedings of TDWG 1: e20382. https://doi.org/10.3897/tdwgproceedings.1.20382
- Vignes Lebbe R, Chesselet P, Diep Thi M (2016) Xper3: new tools for collaborating, training and transmitting knowledge on botanical phenotypes "Botanists of the twenty-first century. In: Rakotoarisoa NR, Blackmore S, Riéra B (Eds) Botanists of the twenty-first century: roles, challenges and opportunities. 228-239 pp. [ISBN 978-92-3-100120-8].